

CLAIMS

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1. Multilayer structure comprising at least one internal layer and at least one external layer, wherein
- 5 ~~characterized in that~~ at least the internal layer is formed from a composition comprising at least one thermoplastic polyamide and at least one impact-resistance modifier present at a concentration by weight of between 10 and 50% of ~~the~~ said composition, and in that at least the external layer is
- 10 formed from a composition comprising as polymer matrix a polyamide composition ~~selected from the group~~ comprising:
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- (i) a polyamide thermoplastic copolymer obtained
- 15 by copolymerization of ε-caprolactam with at least one of the monomers selected from the group comprising:
- an amino acid comprising at least 9 carbon atoms, or the corresponding lactam
  - a mixture of hexamethylenediamine with a diacid
- 20 comprising at least 9 carbon atoms, the ratio by weight between the ε-caprolactam and the total amount of hexamethylenediamine and diacid and/or
- A the said amino acid being between 4 and 9 <sup>or</sup>
- (ii) a mixture of at least the said thermoplastic
- 25 polyamide copolymer (i) and at least one second thermoplastic polyamide or copolyamide obtained by polymerization of monomers ~~comprising fewer than 9~~ carbon atoms, the content by weight of the second

polymer or copolymer in the polymer matrix being  
between 0 and 80% by weight.

2. Structure according to claim 1,  
*wherein*  
~~characterized in that~~ the composition forming the  
external layer comprises a impact modifier.

3. Structure according to claim 2,  
*wherein*  
~~characterized in that~~ the content of impact modifier  
present in the external layer when the polymer matrix  
is formed by the mixture (ii) is between 5% and 50% by  
weight of the thermoplastic composition forming the  
said layer.

4. Structure according to ~~one of claims 1~~  
*claim 1*  
~~to 3, characterized in that~~ *which* it forms a pipe, a tube or  
the walls of a chamber.

5. Structure according to ~~one of claims 1~~  
*which*  
~~to 4, characterized in that~~ it comprises intermediate  
layers arranged between the external and internal  
layers.

6. Structure according to claim 5,  
*wherein at least one*  
~~characterized in that some of the~~ said intermediate  
layers are formed from a composition similar to the one  
forming the external layer of the structure.

7. Structure according to claim 5,  
*wherein at least one*  
~~characterized in that some of the~~ intermediate layers  
are formed from a composition similar to the one  
forming the internal layer.

8. Structure according to ~~one of claims 5~~  
*wherein*  
~~to 7, characterized in that~~ the internal type  
intermediate layers and the external type intermediate

layers are arranged alternately in the transverse direction of the structure.

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5 9. Structure according to ~~one of claims 5 to 8~~, <sup>which</sup> characterized in that it comprises outer layers formed by a composition similar to the one forming the external layer, and at least one intermediate layer formed by a composition of the type forming the internal type layers.

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10 10. Structure according to ~~one of the preceding claims~~, <sup>wherein</sup> characterized in that the composition forming the external layer and/or the external-type intermediate layers comprises a first thermoplastic copolyamide of the 6/6-36 type, and a second thermoplastic polyamide of the PA 6 type.

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15 11. Structure according to ~~one of the preceding claims~~, <sup>wherein</sup> characterized in that the composition forming the external layer and/or the external-type intermediate layers comprises a impact modifier, <sup>optionally</sup> ~~this~~ ~~modifier advantageously~~ comprising functional groups  
20 which can react with the polyamide or polyamides.

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25 12. Structure according to ~~one of the preceding claims~~, <sup>wherein</sup> characterized in that the composition forming the internal layer and/or the internal type intermediate layers has a modulus of less than 1500 MPa, ~~preferably less than 1000 MPa~~.

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13. Structure according to ~~one of the preceding claims~~, <sup>wherein</sup> characterized in that the composition forming the internal layer comprises a chain extender for the polyamide matrix, which is present at a

concentration by weight of between 0.05% and 5% of the polyamide matrix.

14. Structure according to ~~one of the~~ <sup>wherein</sup> preceding claims, characterized in that the impact modifier contained in the composition forming the internal layer is selected from the group comprising compounds having a Tg below 0°C and a modulus of less than 200 MPa.

15. Structure according to claim 14, <sup>wherein</sup> characterized in that the said impact modifier is a compound selected from the polyolefin group.

16. Structure according to claim 14 ~~or 15,~~ <sup>wherein</sup> characterized in that at least some of the impact modifiers comprise polar functional groups capable of reacting with the polyamide matrix.

17. Structure according to claim 16, <sup>wherein</sup> characterized in that the polar functional groups are selected from the group comprising acid, anhydride, acrylic, methacrylic and epoxy functional groups.

18. Structure according to ~~one of~~ <sup>wherein</sup> claims 15 to 17, characterized in that the impact modifier is an ultra-low-density polyethylene (ULDPE) having a density of less than 0.9 and a melt flow index of between 0.1 and 7 g/10 min measured at 190°C under a load of 2.16 kg, preferably of less than 1 g/10 min.

19. Structure according to ~~one of the~~ <sup>wherein</sup> preceding claims, characterized in that the composition forming the internal layer and/or the internal-type intermediate layers comprises a plasticizer for the

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Amended  
polyamide, which is present at a concentration by weight of between 1 and 20% relative to the polyamide matrix, ~~preferably between 5 and 10%.~~

20. Tube or pipe <sup>wherein</sup> ~~characterized in that~~ the wall of this tube or pipe has a multilayer structure according to ~~one of the preceding claims.~~

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